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ABSTRACT

Lone Star 2000 is a collaborative project among the Duval County Public Schools in Jacksonville (Florida), the College of Education and Human Services at the University of North Florida, and the International Business Machines (IBM) Corporation. Primary goals of the project include: making educational technologies available to K-8 students and educating these students using educational technologies and documenting their work through electronic portfolios; preparing elementary school and middle school preservice teachers in new approaches to teaching and learning with educational technologies; and strengthening the link between partner school participants. This paper details the process used to carry out the goals of the Lone Star 2000 project and the use of traditional and nontraditional assessment methods to evaluate progress toward the goals. Steps in the process are: (1) exposure to classroom, curriculum-based technologies; (2) training in the operation of IBM hardware and software; (3) application of technology use in the classroom; (4) integration of technology with existing classroom curriculum materials by the teaching intern; and (5) infusion of technology into classroom teaching and learning when the classroom teacher continues to incorporate technology into daily teaching and learning activities. (Contains 15 references.) (ND)

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# INTEGRATING PREPARATION AND PRACTICE THROUGH A TECHNOLOGY-BASED APPROACH TO PORTFOLIOS FOR PROFESSIONAL DEVELOPMENT USING IBM TECHNOLOGY

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**Integrating Preparation and Practice Through a Technology-Based Approach to Teaching and Learning Using IBM Technology**

**Dennis M. Holt**

The Lone Star 2000 Project

Lone Star 2000 is a collaborative project among the Duval County Public Schools in Jacksonville, Florida, the Division of Curriculum and Instruction in the College of Education and Human Services at the University of North Florida, and the IBM Corporation. Participants in the third year of this project included intern directing teachers from Lone Star Elementary School, Fletcher Middle School, selected preservice teachers completing their internship through the University of North Florida, their supervising professors, and two educational technology teachers. Primary goals of the project included:

- To build a community of learners which effects real change in the teaching and learning process;
- To create exemplary classrooms which make educational technologies available to K-8 students;
- To contribute to the development of a teacher education program;
- To educate K-8 students in selected areas of curriculum using educational technologies and documenting their work through electronic portfolios;
- To prepare selected elementary school and middle school preservice teachers in new approaches to teaching and learning with educational technologies; and,
- To strengthen the link between partner school participants, including K-8 educators, parents, students, school volunteers, university faculty and students, and business partners.

Currently in its fourth year of operation, the project has emerged as an effective model for successfully infusing educational technologies into classroom teaching and learning with measurable, positive impact on student achievement.

**The Process of the Project**

This article details the process used to carry out the goals of the Lone Star 2000 project and the use of traditional and non-traditional assessment methods to evaluate progress toward the goals. Steps in the process are as follows:

1. Exposure to classroom, curriculum-based technologies
2. Knowledge of IBM technology, including hardware and software use
3. Application of technologies with students in the classroom
4. Integration of technology usage with existing classroom curriculum
5. Infusion of technologies into classroom teaching and learning with resultant positive impact on preservice teacher competencies and student learning.

**Exposure** to the IBM curriculum-based courseware is the first step in the process and is accomplished with the preservice teachers during the early weeks of their intern teaching experience. They receive background information on the project and view samples of the technology-based products they and their students will create. Directing teachers are exposed to the technologies in their own or neighboring classrooms and in some cases begin experimenting with it themselves, prior to the start of the project.

**Knowledge** of the operation of IBM hardware and software is addressed during three days of concentrated, hands-on training for the preservice teachers and their respective directing

teachers. The training is delivered by an educational technology teacher educator, takes place at the school site, and addresses the following skills: effective use of the IBM computers and related technology devices, including CD-ROM and large screen projection equipment for use in whole-class computer instruction; efficient use of specific mathematics, science, language arts and social studies courseware designated as the target curriculum emphasis in individual School Improvement Plans; ability to use the LinkWay Live electronic presentation program to create electronic preservice teacher portfolios and student electronic portfolios, detailing knowledge of specific subject areas as well as demonstrating increased use of educational technology; foundation knowledge and hands-on participation in IBM's Teaching and Learning With Computers (TLC) approach which emphasizes a) cooperative learning in a variety of learning centers, b) networked classroom-based curriculum courseware as an integral part of teaching and learning, and c) active discovery-based learning with the teacher as guide and facilitator.

**Application** of technology use in the classroom occurs as the interns begin utilizing the computers, large screen projection devices and specific courseware to teach whole-class lessons to their students, as well as teach the students how to operate the equipment, and use specific courseware programs. This is followed by individual and small-group hands-on learning sessions at the computers, guided by the teaching interns. As the interns practice with the technologies and begin creating LinkWay Live folders detailing information and pictures of their internship, their increasing experience and enthusiasm is shared with the students who then are assisted in creating their own individual electronic portfolios. The directing teachers' behaviors vary at this point (depending on their past experiences with technology) from being interested observers, learning and gaining confidence from the interns' and students' technology successes, to being active participants

that model daily behaviors for technology use in teaching and learning activities.

**Integration** is the crucial step in which technology and curriculum are joined to strengthen and enhance instruction. Integration of technology into the classroom is accomplished when the teaching intern is guided to create and teach lesson plans that utilize the technology *in conjunction with existing curriculum materials* to present subject matter in a unique, creative way that enhances student learning outcomes. A key factor to success in this phase is the flexibility of the IBM curriculum courseware that allows teaching interns to design their own personalized instructional plans, based on their knowledge and the needs of their individual students. Rogers indicates that adoption of technology is an active process where success depends, in large part, on "the degree to which an innovation is changed or modified by a user in the process of it's adoption and implementation". The degree of technology integration has varied among classrooms and grade levels in the course of this project, but in all cases has been influenced by the "ownership" factor, as well as by the critical success factors mentioned later in this article.

**Infusion** of technology into classroom teaching and learning is the true indicator of the success of this model project. The infusion level is achieved when the teaching intern has departed and the classroom teacher continues to develop their own instructional plans, utilizing the curriculum, and incorporating technology usage into daily teaching and learning activities for the purpose of improving student learning outcomes.

**Research-base for the Project**

Based on the work of Reeves (1992) entitled, ***Evaluating Schools Infused with Technology,*** four critical success factors were identified and used as benchmarks for the Lone Star 2000 project.

1. **Clearly defined goals** for the project were identified (listed at the beginning of the article). Reeves states that "Technology infusion as well as other restructuring activities should be driven by clear goals."(p.520) Goals for this project involved "authentic achievement" for preservice teachers and students in the form of portfolios, videos, electronic presentations, and so forth. Newman (1991) also supports the approach in the project by suggesting that "Rather than reproducing knowledge, students should be involved in producing knowledge, through discourse, through the creation of things, and through performance."

2. **Thorough documentation** in all phases of the Lone Star 2000 project provides an understanding of where we started, where we are, and where we are going. Reeves states that (p.522) "documentation attempts to capture all the changes that occur in the process of reform so that interested participants can understand what is really occurring." Examples are provided in the Project Outcomes section below.

3. **Formative experimentation** is defined by Newman ( p.10) "In a formative experiment, the researcher sets a pedagogical goal and finds out what it takes in terms of materials, organization or changes in the technology to reach the goal." The Lone Star 2000 project has adapted and restructured over the three year period to incorporate new knowledge and improved methods for meeting the project goals.

4. **Impact evaluation** is defined by Reeves (p. 524) as "attempts to assess the effects of innovative instructional practices on factors such as organization, climate, teacher and student self-perceptions, parental and community aspirations, and numerous other difficult-to-measure factors." The Lone Star 2000 Project uses traditional and non-

traditional methods of assessment to measure progress toward goals. (See Project Outcomes below).

Critical success factors which follow are based on research by Rogers (1986) that revealed three ways in which adoption of interactive communication innovations differ from similar processes with other k nds of new ideas or tools.

5. **Critical mass of adopters**

The Lone Star 2000 Project began with two very interested teachers and two interns as a core group to influence and persuade others to get involved. Rogers states that "the usefulness of a new communication system increases for all adopters with each additional adopter." Over 450 students and 18 teaching interns have participated in the project over the past three years.

6. **Degree of use**

Continued, supported use of the technology was critical to its eventual classroom infusion and diffusion to other users. Rogers believes that "The degree of use of a communications innovation rather than the decision to adopt it, is the dependent variable that will indicate the success of the diffusion effort."

7. **Re-invention of the innovations** is defined by Rogers (1983, pp.16-17) as "the degree to which an innovation is changed or modified by a user in the process of its adoption and implementation." Infusion of the technology into classrooms in the Lone Star 2000 project took place when teachers and interns were able to successfully *design and implement* instructional activities using the educational technologies that met their own specific needs and those of their students.

**Project Outcomes**

Outcomes for this project are detailed below and include traditional and non-traditional methods of assessment.

**Traditional methods** for measuring learning outcomes in this project included:

- Intern grade reports
- Formal and informal observations

  Observations were conducted for each intern during the course of the teaching experience by the directing teachers from the schools and the supervising professors from the University.
- Standardized test results

  CTBS scores at Lone Star were compared for classrooms with and without significant amounts of educational technology use and integration with instruction.

**Non-traditional assessment instruments** included:

- Journals (process portfolios)

  Teaching interns produced daily journals of their experiences in the classroom, the educational technology training they received, how the IBM software integrated with the curriculum at their grade level and how they implemented their knowledge of educational technology in the classroom for instruction.

- Videotaped lessons

  Teaching interns produced videos of their delivery of student classroom instruction using technology. These videos were used for formative assessment as well as product outcomes to demonstrate their effective use of technology to enhance classroom teaching and learning.

- Electronic student portfolios (product portfolio)

  Each teaching intern *and their students* created electronic portfolios with LinkWay Live that used text, sound, and graphics to illustrate their knowledge of various subject matter learned in science, language arts, reading, mathematics and social studies, as well as their increased knowledge of the use of technology and specific software programs.

- Interview questionnaire for directing teachers, principals and teaching interns

  The questionnaire included topics such as: their level of comfort in using the technologies; responses of students to the technology in attitude and performance; observations of parent reactions to the student's technology use; degree to which the IBM software assisted interns in delivering instruction in various curriculum areas.

- Successful job placement for interns in the project

  Interns in the project found teaching positions within the first semester after graduation.

- Increased number of classrooms using educational technology for increased amounts of time.

- Student self-assessment attitude surveys
- Volunteer logs and activity sign-in sheets

Increased parent involvement was demonstrated by nine participants in attendance at a special Saturday training for parent technology volunteers and in their subsequent hours providing classroom assistance. Also, a Technology Night which showcased Lone Star Elementary's first grade student's electronic portfolios was attended by over 100 parents..

- Business partner funding
- Increased number of technology grants applied for and received

Based on documentation of the positive results of evaluations from the previous years and a clear implementation plan, project participants were successful in applying for and receiving education grants to further this technology project.

**Conclusion**

The Lone Star 2000 project enabled participants to discover that educational technologies can be very useful tools to infuse and document teaching and learning. When appropriately supported, university and public school personnel, working together within partnership schools can help bring barriers down; develop visions and change perspectives; and become open to permanent change.

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